SEQUENCE LISTING

<110> HSC Research Development Limited Partnership et al

<120> RAS Activator Nucleic Acid Molecules, Polypeptides and
      Methods of Use

<130> 1786/0019

<140> PCT/CA00/00042
<141> 2000-01-20

<150> 2,259,830
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Lys Thr Asn Leu Phe Val Phe Lys Glu Leu Leu Thr Arg Leu Ser Glu
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Val Ile Gly Leu Glu Lys Val Asn Lys Lys Ser Lys Ala Asn Thr Val
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Leu Ser Lys Leu Ala Asp Arg Ile Gln Leu Ser Gly Arg Tyr Tyr Leu
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cta gat gtt gct cag aca ggt ggt cat aaa aag cgg gta cgt cgt agt   2939
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Ser Leu Gln Thr Leu Ser Leu Gln Cys Glu Pro Ala Thr Asn Thr Leu
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ccc cag cag cag cca cca cca gca cat aaa atc aac cag gga cta cag   3227
Pro Gln Gln Gln Pro Pro Pro Ala His Lys Ile Asn Gln Gly Leu Gln
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cac gat gag agg cgc cag agg cat tct gtc agc atc gtg gaa aca aac   3611
His Asp Glu Arg Arg Gln Arg His Ser Val Ser Ile Val Glu Thr Asn
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Leu Gly Met Gly Arg Met Glu Arg Arg Thr Met Ile Glu Pro Asp Gln
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tat agc ttg ggg tcc tat gca cca atg tcc gag ggc cga ggc tta tat   3707
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gct aca gct aca gta att tct tct cca agc aca gag gaa ctt tcc cag   3755
Ala Thr Ala Thr Val Ile Ser Ser Pro Ser Thr Glu Glu Leu Ser Gln
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cag cac cag aga agc tgg gag act ctt cca ttc ggg cat act cac ttt    3899
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Asp Tyr Ser Gly Asp Pro Ala Gly Leu Trp Ala Ser Ser Ser His Met
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Ala Thr Glu Ser Glu Ala Gly Asp Met Asp Leu Ser Gly Leu Pro Glu
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Leu Cys Met Gly Asn Ser Phe Gly Val Ser Pro Thr Met Asp Lys Glu
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Cys Ile Ala Gln Gln Asp Tyr Cys Arg Ile Leu Asn Gln Val Glu Lys
225   230   235   240
Asn Met Gln Lys Val Glu Glu Glu Gly Glu Ile Val Met Val Lys Glu

```
                    245                  250                  255
His Arg Glu Leu Asp Arg Thr Gly Thr Arg Lys Gly His Ile Val Ile
        260                  265                  270
Lys Gly Thr Ser Glu Arg Leu Thr Met His Leu Val Glu Glu His Ser
        275                  280                  285
Val Val Asp Pro Thr Phe Ile Glu Asp Phe Leu Leu Thr Tyr Arg Thr
        290                  295                  300
Phe Leu Ser Ser Pro Met Glu Val Gly Lys Lys Leu Leu Glu Trp Phe
305                  310                  315                  320
Asn Asp Pro Ser Leu Arg Asp Lys Val Thr Arg Val Val Leu Leu Trp
                325                  330                  335
Val Asn Asn His Phe Asn Asp Phe Glu Gly Asp Pro Ala Met Thr Arg
                340                  345                  350
Phe Leu Glu Glu Phe Glu Asn Asn Leu Glu Arg Glu Lys Met Gly Gly
        355                  360                  365
His Leu Arg Leu Leu Asn Ile Ala Cys Ala Ala Lys Ala Lys Arg Arg
        370                  375                  380
Leu Met Thr Leu Thr Lys Pro Ser Arg Glu Ala Pro Leu Pro Phe Ile
385                  390                  395                  400
Leu Leu Gly Gly Ser Glu Lys Gly Phe Gly Ile Phe Val Asp Ser Val
                405                  410                  415
Asp Ser Gly Ser Lys Ala Thr Glu Ala Gly Leu Lys Arg Gly Asp Gln
                420                  425                  430
Ile Leu Glu Val Asn Gly Gln Asn Phe Glu Asn Ile Gln Leu Ser Lys
        435                  440                  445
Ala Met Glu Ile Leu Arg Asn Asn Thr His Leu Ser Ile Thr Val Lys
        450                  455                  460
Thr Asn Leu Phe Val Phe Lys Glu Leu Leu Thr Arg Leu Ser Glu Glu
465                  470                  475                  480
Lys Arg Asn Gly Ala Pro His Leu Pro Lys Ile Gly Asp Ile Lys Lys
                485                  490                  495
Ala Ser Arg Tyr Ser Ile Pro Asp Leu Ala Val Asp Val Glu Gln Val
        500                  505                  510
Ile Gly Leu Glu Lys Val Asn Lys Lys Ser Lys Ala Asn Thr Val Gly
        515                  520                  525
Gly Arg Asn Lys Leu Lys Lys Ile Leu Asp Lys Thr Arg Ile Ser Ile
        530                  535                  540
Leu Pro Gln Lys Pro Tyr Asn Asp Ile Gly Ile Gly Gln Ser Gln Asp
545                  550                  555                  560
Asp Ser Ile Val Gly Leu Arg Gln Thr Lys His Ile Pro Thr Ala Leu
                565                  570                  575
Pro Val Ser Gly Thr Leu Ser Ser Ser Asn Pro Asp Leu Leu Gln Ser
        580                  585                  590
His His Arg Ile Leu Asp Phe Ser Ala Thr Pro Asp Leu Pro Asp Gln
        595                  600                  605
Val Leu Arg Val Phe Lys Ala Asp Gln Gln Ser Arg Tyr Ile Met Ile
        610                  615                  620
Ser Lys Asp Thr Thr Ala Lys Glu Val Val Ile Gln Ala Ile Arg Glu
625                  630                  635                  640
Phe Ala Val Thr Ala Thr Pro Asp Gln Tyr Ser Leu Cys Glu Val Ser
                645                  650                  655
Val Thr Pro Glu Gly Val Ile Lys Gln Arg Arg Leu Pro Asp Gln Leu
                660                  665                  670
Ser Lys Leu Ala Asp Arg Ile Gln Leu Ser Gly Arg Tyr Tyr Leu Lys
        675                  680                  685
Asn Asn Met Glu Thr Glu Thr Leu Cys Ser Asp Glu Asp Ala Gln Glu
        690                  695                  700
```

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Leu Leu Arg Glu Ser Gln Ile Ser Leu Leu Gln Leu Ser Thr Val Glu
705                 710                 715                 720
Val Ala Thr Gln Leu Ser Met Arg Asn Phe Glu Leu Phe Arg Asn Ile
                725                 730                 735
Glu Pro Thr Glu Tyr Ile Asp Asp Leu Phe Lys Leu Arg Ser Lys Thr
                740                 745                 750
Ser Cys Ala Asn Leu Lys Arg Phe Glu Glu Val Ile Asn Gln Glu Thr
                755                 760                 765
Phe Trp Val Ala Ser Glu Ile Leu Arg Glu Thr Asn Gln Leu Lys Arg
        770                 775                 780
Met Lys Ile Ile Lys His Phe Ile Lys Ile Ala Leu His Cys Arg Glu
785                 790                 795                 800
Cys Lys Asn Phe Asn Ser Met Phe Ala Ile Ile Ser Gly Leu Asn Leu
                805                 810                 815
Ala Pro Val Ala Arg Leu Arg Thr Thr Trp Glu Lys Leu Pro Asn Lys
        820                 825                 830
Tyr Glu Lys Leu Phe Gln Asp Leu Gln Asp Leu Phe Asp Pro Ser Arg
        835                 840                 845
Asn Met Ala Lys Tyr Arg Asn Val Leu Asn Ser Gln Asn Leu Gln Pro
    850                 855                 860
Pro Ile Ile Pro Leu Phe Pro Val Ile Lys Lys Asp Leu Thr Phe Leu
865                 870                 875                 880
His Glu Gly Asn Asp Ser Lys Val Asp Gly Leu Val Asn Phe Glu Lys
                885                 890                 895
Leu Arg Met Ile Ala Lys Glu Ile Arg His Val Gly Arg Met Ala Ser
                900                 905                 910
Val Asn Met Asp Pro Ala Leu Met Phe Arg Thr Arg Lys Lys Lys Trp
        915                 920                 925
Arg Ser Leu Gly Ser Leu Ser Gln Gly Ser Thr Asn Ala Thr Val Leu
    930                 935                 940
Asp Val Ala Gln Thr Gly Gly His Lys Lys Arg Val Arg Arg Ser Ser
945                 950                 955                 960
Phe Leu Asn Ala Lys Lys Leu Tyr Glu Asp Ala Gln Met Ala Arg Lys
                965                 970                 975
Val Lys Gln Tyr Leu Ser Asn Leu Glu Leu Glu Met Asp Glu Glu Ser
                980                 985                 990
Leu Gln Thr Leu Ser Leu Gln Cys Glu Pro Ala Thr Asn Thr Leu Pro
        995                 1000                1005
Lys Asn Pro Gly Asp Lys Lys Pro Val Lys Ser Glu Thr Ser Pro Val
    1010                1015                1020
Ala Pro Arg Ala Gly Ser Gln Gln Lys Ala Gln Ser Leu Pro Gln Pro
1025                1030                1035                1040
Gln Gln Gln Pro Pro Ala His Lys Ile Asn Gln Gly Leu Gln Val
                1045                1050                1055
Pro Ala Val Ser Leu Tyr Pro Ser Arg Lys Lys Val Pro Val Lys Asp
        1060                1065                1070
Leu Pro Pro Phe Gly Ile Asn Ser Pro Gln Ala Leu Lys Lys Ile Leu
        1075                1080                1085
Ser Leu Ser Glu Glu Gly Ser Leu Glu Arg His Lys Lys Gln Ala Glu
    1090                1095                1100
Asp Thr Ile Ser Asn Ala Ser Ser Gln Leu Ser Ser Pro Pro Thr Ser
1105                1110                1115                1120
Pro Gln Ser Ser Pro Arg Lys Gly Tyr Thr Leu Ala Pro Ser Gly Thr
            1125                1130                1135
Val Asp Asn Phe Ser Asp Ser Gly His Ser Glu Ile Ser Ser Arg Ser
        1140                1145                1150
Ser Ile Val Ser Asn Ser Ser Phe Asp Ser Val Pro Val Ser Leu His
```

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                1155              1160               1165
Asp Glu Arg Arg Gln Arg His Ser Val Ser Ile Val Glu Thr Asn Leu
       1170              1175               1180
Gly Met Gly Arg Met Glu Arg Arg Thr Met Ile Glu Pro Asp Gln Tyr
   1185            1190               1195            1200
Ser Leu Gly Ser Tyr Ala Pro Met Ser Glu Gly Arg Gly Leu Tyr Ala
           1205             1210             1215
Thr Ala Thr Val Ile Ser Ser Pro Ser Thr Glu Glu Leu Ser Gln Asp
           1220             1225             1230
Gln Gly Asp Arg Ala Ser Leu Asp Ala Ala Asp Ser Gly Arg Gly Ser
       1235             1240             1245
Trp Thr Ser Cys Ser Ser Gly Ser His Asp Asn Ile Gln Thr Ile Gln
   1250             1255             1260
His Gln Arg Ser Trp Glu Thr Leu Pro Phe Gly His Thr His Phe Asp
1265            1270               1275            1280
Tyr Ser Gly Asp Pro Ala Gly Leu Trp Ala Ser Ser Ser His Met Asp
           1285             1290             1295
Gln Ile Met Phe Ser Asp His Ser Thr Lys Tyr Asn Arg Gln Asn Gln
           1300             1305             1310
Ser Arg Glu Ser Leu Glu Gln Ala Gln Ser Arg Ala Ser Trp Ala Ser
       1315             1320             1325
Ser Thr Gly Tyr Trp Gly Glu Asp Ser Glu Gly Asp Thr Gly Thr Ile
   1330             1335             1340
Lys Arg Arg Gly Gly Lys Asp Val Ser Ile Glu Ala Glu Ser Ser Ser
1345            1350             1355            1360
Leu Thr Ser Val Thr Thr Glu Glu Thr Lys Pro Val Pro Met Pro Ala
           1365             1370             1375
His Ile Ala Val Ala Ser Ser Thr Thr Lys Gly Leu Ile Ala Arg Lys
           1380             1385             1390
Glu Gly Arg Tyr Arg Glu Pro Pro Thr Pro Pro Gly Tyr Ile Gly
       1395             1400             1405
Ile Pro Ile Thr Asp Phe Pro Glu Gly His Ser His Pro Ala Arg Lys
   1410             1415             1420
Pro Pro Asp Tyr Asn Val Ala Leu Gln Arg Ser Arg Met Val Ala Arg
1425            1430             1435            1440
Ser Ser Asp Thr Ala Gly Pro Ser Ser Val Gln Gln Pro His Gly His
           1445             1450             1455
Pro Thr Ser Ser Arg Pro Val Asn Lys Pro Gln Trp His Lys Pro Asn
       1460             1465             1470
Glu Ser Asp Pro Arg Leu Ala Pro Tyr Gln Ser Gln Gly Phe Ser Thr
   1475             1480             1485
Glu Glu Asp Glu Asp Glu Gln Val Ser Ala Val
   1490             1495


<210> 3
<211> 799
<212> DNA
<213> Mus musculus

<400> 3
actaaaggga acaaaagctg gagctccacc gcggtggcgg ccgctctaga actagtggat 60
cccccgggct gcaggaattc aagcggtggg aaggatgtct ccgctgaggc agagagcagc 120
agcatggtgc ccgtgactac agaggaagcc aaacctgtcc ctatgcctgc ccacatagct 180
gtgacgccga gcactaccaa gggactcatc gcacggaagg aaggcaggta ccgggagccg 240
cctcccacac ctccaggcta cgtgggcatc cccattgccg atttcccaga agggccttgc 300
```

```
cacccggcca ggaagccccc ggattacaac gtggccctgc agcggtcccg catggtggca 360
cggcccactg aggcccccggc accgggccag acgccgcctg cagccgcagc cagccggccg 420
ggcagcaagc cacagtggca caagcccagc gacgcagacc cacgcctcgc gcccttccag 480
gcaggcttcg caggagcgga ggaggacgaa gatgaacaag tgtctgctgt ttgaggcgca 540
ggctccttga tccacagtga gccacccaaa ggagagcaca agaagacgtc ccaagccttg 600
gagccttggc acgcacatct gaggatggtg gaccagtttg cctccttccc tgccttaaag 660
cagcatgggg cttcttctcc ccttcttcct ttccccttttg catgtgaaat actgtgaaga 720
aattgccctg cactttgcca gacttgttgc ttgaaatgca cagcccagca gcccctgagc 780
tgctgcctgc cacgtcacg                                            799
```

<210> 4
<211> 286
<212> PRT
<213> Homo sapiens

<400> 4
```
Thr Lys Gly Asn Lys Ser Trp Ser Ser Thr Ala Val Ala Ala Ala Leu
 1               5                  10                  15

Glu Leu Val Asp Pro Pro Gly Cys Arg Asn Ser Ser Gly Gly Lys Asp
              20                  25                  30

Val Ser Ala Glu Ala Glu Ser Ser Ser Met Val Pro Val Thr Thr Glu
          35                  40                  45

Glu Ala Lys Pro Val Pro Met Pro Ala His Ile Ala Val Thr Pro Ser
      50                  55                  60

Thr Thr Lys Gly Leu Ile Ala Arg Lys Glu Gly Arg Tyr Arg Glu Pro
 65                  70                  75                  80

Pro Pro Thr Pro Pro Gly Tyr Val Gly Ile Pro Ile Ala Asp Phe Pro
                  85                  90                  95

Glu Gly Pro Cys His Pro Ala Arg Lys Pro Pro Asp Tyr Asn Val Ala
              100                 105                 110

Leu Gln Arg Ser Arg Met Val Ala Arg Pro Thr Glu Ala Pro Ala Pro
          115                 120                 125

Gly Gln Thr Pro Pro Ala Ala Ala Ala Ser Arg Pro Gly Ser Lys Pro
      130                 135                 140

Gln Trp His Lys Pro Ser Asp Ala Asp Pro Arg Leu Ala Pro Phe Gln
145                 150                 155                 160

Ala Ala Ser His Ser Gly Thr Ser Pro Ala Thr Gln Thr His Ala Ser
              165                 170                 175

Arg Pro Ser Arg Gln Ala Ser Gln Glu Arg Arg Arg Thr Lys Met Asn
          180                 185                 190

Lys Cys Leu Leu Phe Glu Ala Gln Ala Pro Xaa Ser Thr Val Ser His
          195                 200                 205

Pro Lys Glu Ser Thr Arg Arg Arg Pro Lys Pro Trp Ser Leu Gly Thr
```

His Ile Xaa Gly Trp Trp Thr Ser Leu Pro Pro Ser Leu Pro Xaa Ser
225 230 235 240

Ser Met Gly Leu Leu Leu Pro Phe Phe Leu Ser Pro Leu His Val Lys
245 250 255

Tyr Cys Glu Glu Ile Ala Leu Ala Leu Cys Arg Leu Val Ala Xaa Asn
260 265 270

Ala Gln Pro Ser Ser Pro Xaa Ala Ala Ala Cys His Val Thr
275 280 285

<210> 5
<211> 245
<212> PRT
<213> Homo sapiens

<400> 5
Leu Lys Gly Thr Lys Ala Gly Ala Pro Pro Arg Trp Arg Pro Leu Xaa
1   5   10   15

Asn Xaa Trp Ile Pro Arg Ala Ala Gly Ile Gln Ala Val Gly Arg Met
            20   25   30

Ser Pro Leu Arg Gln Arg Ala Ala Ala Trp Cys Pro Xaa Leu Gln Arg
        35   40   45

Lys Pro Asn Leu Ser Leu Cys Leu Pro Thr Xaa Leu Xaa Arg Arg Ala
    50   55   60

Leu Pro Arg Asp Ser Ser His Gly Arg Lys Ala Gly Thr Gly Ser Arg
65   70   75   80

Leu Pro His Leu Gln Ala Thr Trp Ala Ser Pro Leu Pro Ile Ser Gln
                85   90   95

Lys Gly Leu Ala Thr Arg Pro Gly Ser Pro Arg Ile Thr Thr Trp Pro
            100   105   110

Cys Ser Gly Pro Ala Trp Trp His Gly Pro Leu Arg Pro Arg His Arg
            115   120   125

Ala Arg Arg Arg Leu Gln Pro Gln Pro Ala Gly Arg Arg Leu Arg Arg
    130   135   140

Ser Gly Gly Gly Arg Arg Xaa Thr Ser Val Cys Cys Leu Arg Arg Arg
145   150   155   160

Leu Leu Asp Pro Gln Xaa Ala Thr Gln Arg Arg Ala Gln Glu Asp Val
                165   170   175

Pro Ser Leu Gly Ala Leu Ala Arg Thr Ser Glu Asp Gly Gly Pro Val
                180   185   190

```
Cys Leu Leu Pro Cys Leu Lys Ala Ala Trp Gly Phe Phe Ser Pro Ser
        195             200             205

Ser Phe Pro Leu Cys Met Xaa Asn Thr Val Lys Lys Leu Pro Trp His
    210             215             220

Phe Ala Asp Leu Leu Leu Glu Met His Ser Pro Ala Ala Pro Glu Leu
225             230             235             240

Leu Pro Ala Thr Ser
                245


<210> 6
<211> 266
<212> PRT
<213> Homo sapiens

<400> 6
Xaa Arg Glu Gln Lys Leu Glu Leu His Arg Gly Gly Gly Arg Ser Arg
 1               5               10              15

Thr Ser Gly Ser Pro Gly Leu Gln Glu Phe Lys Arg Trp Glu Gly Cys
            20              25              30

Leu Arg Xaa Gly Arg Glu Gln Gln His Gly Ala Arg Asp Tyr Arg Gly
        35              40              45

Ser Gln Thr Cys Pro Tyr Ala Cys Pro His Ser Cys Asp Ala Glu His
    50              55              60

Tyr Gln Gly Thr His Arg Thr Glu Gly Arg Gln Val Pro Gly Ala Ala
65              70              75              80

Ser His Thr Ser Arg Leu Arg Gly His Pro His Cys Arg Phe Pro Arg
            85              90              95

Arg Ala Leu Pro Pro Gly Gln Glu Ala Pro Gly Leu Gln Arg Gly Pro
        100             105             110

Ala Ala Val Pro His Gly Gly Thr Ala His Xaa Gly Pro Gly Thr Gly
        115             120             125

Pro Asp Ala Ala Cys Ser Arg Ser Gln Pro Ala Gly Gln Gln Ala Thr
    130             135             140

Val Ala Gln Ala Gln Arg Arg Arg Pro Thr Pro Arg Ala Leu Pro Gly
145             150             155             160

Ala Gly Phe Ala Gly Ala Glu Glu Asp Glu Asp Glu Gln Val Ser Ala
            165             170             175

Val Xaa Gly Ala Gly Ser Leu Ile His Ser Glu Pro Pro Lys Gly Glu
        180             185             190

His Lys Lys Thr Ser Gln Ala Leu Glu Pro Trp His Ala His Leu Arg
        195             200             205
```

```
Met Val Asp Gln Phe Ala Ser Phe Pro Ala Leu Lys Gln His Gly Ala
    210             215             220

Ser Ser Pro Leu Leu Pro Phe Pro Phe Ala Cys Glu Ile Leu Xaa Arg
225             230             235                     240

Asn Cys Pro Gly Thr Leu Gln Thr Cys Cys Leu Lys Cys Thr Ala Gln
            245             250             255

Gln Pro Leu Ser Cys Cys Leu Pro Arg His
            260             265
```

<210> 7
<211> 307
<212> PRT
<213> Drosophila melanogaster

<400> 7
```
Ser Asn Val His Phe Leu His Leu Asn Ala Tyr Glu Leu Ala Ile Gln
  1           5               10              15

Leu Thr Leu Gln Asp Phe Ala Asn Phe Arg Gln Ile Glu Ser Thr Glu
            20              25              30

Tyr Val Asp Glu Leu Phe Glu Leu Arg Ser Arg Tyr Gly Val Pro Met
        35              40              45

Leu Ser Lys Phe Ala Glu Leu Val Asn Arg Glu Met Phe Trp Val Val
    50              55              60

Ser Glu Ile Cys Ala Glu His Asn Ile Val Arg Arg Met Lys Ile Val
 65             70              75              80

Lys Gln Phe Ile Lys Ile Ala Arg His Cys Lys Glu Cys Arg Asn Phe
            85              90              95

Asn Ser Met Phe Ala Ile Val Ser Gly Leu Gly His Gly Ala Val Ser
            100             105             110

Arg Leu Arg Gln Thr Trp Glu Lys Leu Pro Ser Lys Tyr Gln Arg Leu
        115             120             125

Phe Asn Asp Leu Gln Asp Leu Met Asp Pro Ser Arg Asn Met Ser Lys
    130             135             140

Tyr Arg Gln Leu Val Ser Ala Glu Leu Leu Ala Gln His Pro Ile Ile
145             150             155             160

Pro Phe Tyr Pro Ile Val Lys Lys Asp Leu Thr Phe Ile His Leu Gly
            165             170             175

Asn Asp Thr Arg Val Asp Gly Leu Val Asn Phe Glu Lys Leu Arg Met
            180             185             190

Leu Ala Lys Glu Val Arg Leu Leu Thr His Met Cys Ser Ser Pro Tyr
```

```
Asp Leu Leu Ser Ile Leu Glu Leu Lys Gly Gln Ser Pro Ser Asn Ala
    210             215             220

Leu Phe Ser Leu Asn Gln Met Ser Ala Ser Gln Ser Asn Ala Ala Ala
225             230             235                 240

Gly Thr Val Ile Ala Ala Asn Ala Gly Gln Ala Thr Ile Lys Arg Arg
                245             250                 255

Lys Lys Ser Thr Ala Ala Pro Asn Pro Lys Lys Met Phe Glu Glu Ala
            260             265             270

Gln Met Val Arg Arg Val Lys Ala Tyr Leu Asn Ser Leu Lys Ile Leu
        275             280             285

Ser Asp Glu Asp Leu Leu His Lys Phe Ser Leu Glu Cys Glu Pro Ala
    290             295             300

His Gly Ser
305


<210> 8
<211> 270
<212> PRT
<213> Homo sapiens

<400> 8
Ser Ala Glu Gly Leu Asp Leu Val Ser Ala Lys Asp Leu Ala Gly Gln
1               5               10              15

Leu Thr Asp His Asp Trp Ser Leu Phe Asn Ser Ile His Gln Val Glu
            20              25              30

Leu Ile His Tyr Val Leu Gly Pro Gln His Leu Arg Asp Val Thr Thr
        35              40              45

Ala Asn Leu Glu Arg Phe Met Arg Arg Phe Asn Glu Leu Gln Tyr Trp
    50              55              60

Val Ala Thr Glu Leu Cys Leu Cys Pro Val Pro Gly Pro Arg Ala Gln
65              70              75                  80

Leu Leu Arg Lys Phe Ile Lys Leu Ala Ala His Leu Lys Glu Gln Lys
            85              90                  95

Asn Leu Asn Ser Phe Phe Ala Val Met Phe Gly Leu Ser Asn Ser Ala
            100             105             110

Ile Ser Arg Leu Ala His Thr Trp Glu Arg Leu Pro His Lys Val Arg
        115             120             125

Lys Leu Tyr Ser Ala Leu Glu Arg Leu Leu Asp Pro Ser Trp Asn His
    130             135             140
```

```
Arg Val Tyr Arg Leu Ala Leu Ala Lys Leu Ser Pro Pro Val Ile Pro
145                 150             155             160

Phe Met Pro Leu Leu Leu Lys Asp Met Thr Phe Ile His Glu Gly Asn
                165             170             175

His Thr Leu Val Glu Asn Leu Ile Asn Phe Glu Lys Met Arg Met Met
                180             185             190

Ala Arg Ala Ala Arg Met Leu His His Cys Arg Ser His Asn Pro Val
        195             200             205

Pro Leu Ser Pro Leu Arg Ser Arg Val Ser His Leu His Glu Asp Ser
        210             215             220

Gln Val Ala Arg Ile Ser Thr Cys Ser Glu Gln Ser Leu Ser Thr Arg
225             230             235             240

Ser Pro Ala Ser Thr Trp Ala Tyr Val Gln Gln Leu Lys Val Ile Asp
                245             250             255

Asn Gln Arg Glu Leu Ser Arg Leu Ser Arg Glu Leu Glu Pro
                260             265             270


<210> 9
<211> 244
<212> PRT
<213> Mus musculus

<400> 9
Lys Ala Glu Cys Phe Glu Thr Leu Ser Ala Met Glu Leu Ala Glu Gln
1               5               10              15

Ile Thr Leu Leu Asp His Ile Val Phe Arg Ser Ile Pro Tyr Glu Glu
                20              25              30

Phe Leu Gly Gln Gly Trp Met Lys Leu Asp Lys Asn Glu Arg Thr Pro
            35              40              45

Tyr Ile Met Lys Thr Ser Gln His Phe Asn Glu Met Ser Asn Leu Val
        50              55              60

Ala Ser Gln Ile Met Asn Tyr Ala Asp Ile Ser Ser Arg Pro Asn Ala
65              70              75              80

Ile Glu Lys Trp Val Ala Val Ala Asp Ile Cys Arg Cys Leu His Asn
                85              90              95

Tyr Asn Gly Val Leu Glu Ile Thr Ser Ala Leu Asn Arg Ser Pro Ile
            100             105             110

Tyr Arg Leu Lys Lys Thr Trp Ala Lys Val Ser Lys Gln Thr Lys Ala
            115             120             125

Leu Met Asp Lys Leu Gln Lys Thr Val Ser Ser Glu Gly Arg Phe Lys
        130             135             140
```

```
Asn Leu Arg Glu Thr Leu Lys Asn Cys Asn Pro Pro Ala Val Pro Tyr
145                 150                 155                 160

Leu Gly Met Tyr Leu Thr Asp Leu Ala Phe Ile Glu Glu Gly Thr Pro
                165                 170                 175

Asn Phe Thr Glu Glu Gly Leu Val Asn Phe Ser Lys Met Arg Met Ile
            180                 185                 190

Ser His Ile Ile Arg Glu Ile Arg Gln Phe Gln Gln Thr Ala Tyr Arg
        195                 200                 205

Ile Asp Gln Gln Pro Lys Val Ile Gln Tyr Leu Leu Asp Lys Ala Leu
        210                 215                 220

Val Ile Asp Glu Asp Ser Leu Tyr Glu Leu Ser Leu Lys Ile Glu Pro
225                 230                 235                 240

Arg Leu Pro Ala
```

<210> 10
<211> 249
<212> PRT
<213> Homo sapiens

<400> 10
```
Asp Glu Ile Thr Leu Leu Thr Leu His Pro Leu Glu Leu Ala Arg Gln
  1               5                  10                  15

Leu Thr Leu Leu Glu Phe Glu Met Tyr Lys Asn Val Lys Pro Ser Glu
            20                  25                  30

Leu Val Gly Ser Pro Trp Thr Lys Lys Asp Lys Glu Val Lys Ser Pro
            35                  40                  45

Asn Leu Leu Lys Ile Met Lys His Thr Thr Asn Val Thr Arg Trp Ile
        50                  55                  60

Glu Lys Ser Ile Thr Glu Ala Glu Asn Tyr Glu Glu Arg Leu Ala Ile
65                  70                  75                  80

Met Gln Arg Ala Ile Glu Val Met Met Val Met Leu Glu Leu Asn Asn
                85                  90                  95

Phe Asn Gly Ile Leu Ser Ile Val Ala Ala Met Gly Thr Ala Ser Val
            100                 105                 110

Tyr Arg Leu Arg Trp Thr Phe Gln Gly Leu Pro Glu Arg Tyr Arg Lys
        115                 120                 125

Phe Leu Glu Glu Cys Arg Glu Leu Ser Asp Asp His Leu Lys Lys Tyr
        130                 135                 140

Gln Glu Arg Leu Arg Ser Ile Asn Pro Pro Cys Val Pro Phe Phe Gly
```

```
Arg Tyr Leu Thr Asn Ile Leu His Leu Glu Glu Gly Asn Pro Asp Leu
                165                    170                    175

Leu Ala Asn Thr Glu Leu Ile Asn Phe Ser Lys Arg Arg Lys Val Ala
                180                    185                    190

Glu Ile Ile Gly Glu Ile Gln Gln Tyr Gln Asn Gln Pro Tyr Cys Leu
                195                    200                    205

Asn Glu Glu Ser Thr Ile Arg Gln Phe Phe Glu Gln Leu Asp Pro Phe
    210                    215                    220

Asn Gly Leu Ser Asp Lys Gln Met Ser Asp Tyr Leu Tyr Asn Glu Ser
225                    230                    235                    240

Leu Arg Ile Glu Pro Arg Gly Cys Lys
                245
```

```
<210> 11
<211> 243
<212> PRT
<213> Homo sapiens

<400> 11
Val Ser Leu Leu Phe Asp His Leu Glu Pro Glu Glu Leu Ser Glu His
  1               5                     10                     15

Leu Thr Tyr Leu Glu Phe Lys Ser Phe Arg Arg Ile Ser Phe Ser Asp
                20                     25                     30

Tyr Gln Asn Tyr Leu Val Asn Ser Cys Val Lys Glu Asn Pro Thr Met
          35                     40                     45

Glu Arg Ser Ile Ala Leu Cys Asn Gly Ile Ser Gln Trp Val Gln Leu
        50                     55                     60

Met Val Leu Ser Arg Pro Thr Pro Gln Leu Arg Ala Glu Val Phe Ile
65                     70                     75                     80

Lys Phe Ile Gln Val Ala Gln Lys Leu His Gln Leu Gln Asn Phe Asn
                85                     90                     95

Thr Leu Met Ala Val Ile Gly Gly Leu Cys His Ser Ser Ile Ser Arg
                100                    105                    110

Leu Lys Glu Thr Ser Ser His Val Pro His Glu Ile Asn Lys Val Leu
                115                    120                    125

Gly Glu Met Thr Glu Leu Leu Ser Ser Ser Arg Asn Tyr Asp Asn Tyr
                130                    135                    140

Arg Arg Ala Tyr Gly Glu Cys Thr Asp Phe Lys Ile Pro Ile Leu Gly
145                    150                    155                    160
```

Val His Leu Lys Asp Leu Ile Ser Leu Tyr Glu Ala Met Pro Asp Tyr
            165   170   175

Leu Glu Asp Gly Lys Val Asn Val His Lys Leu Leu Ala Leu Tyr Asn
            180   185   190

His Ile Ser Glu Leu Val Gln Leu Gln Glu Val Ala Pro Pro Leu Glu
            195   200   205

Ala Asn Lys Asp Leu Val His Leu Leu Thr Leu Ser Leu Asp Leu Tyr
    210   215   220

Tyr Thr Glu Asp Glu Ile Tyr Glu Leu Ser Tyr Ala Arg Glu Pro Arg
225   230   235   240

Asn His Arg

<210> 12
<211> 48
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: unavailable

<400> 12
Ile Arg Gly Gly Thr Lys Glu Ala Leu Ile Glu His Leu Thr Ser His
  1   5   10   15

Glu Leu Val Asp Ala Ala Phe Asn Val Thr Met Leu Ile Thr Phe Arg
            20   25   30

Ser Ile Leu Thr Thr Arg Glu Phe Phe Tyr Ala Leu Ile Tyr Arg Tyr
        35   40   45

<210> 13
<211> 47
<212> PRT
<213> Mus musculus

<400> 13
Ile Lys Gly Gly Thr Val Val Lys Leu Ile Glu Arg Leu Thr Tyr His
  1   5   10   15

Met Tyr Ala Asp Pro Asn Phe Val Arg Thr Phe Leu Thr Tyr Arg Ser
            20   25   30

Phe Cys Lys Gln Glu Leu Leu Asn Leu Leu Ile Glu Arg Phe Glu
        35   40   45

<210> 14
<211> 48
<212> PRT
<213> Mus musculus

<400> 14
Ile Arg Tyr Ala Ser Val Glu Ala Leu Leu Glu Arg Leu Thr Asp Leu
 1   5   10   15

Arg Phe Leu Ser Ile Asp Phe Leu Asn Thr Phe Leu His Thr Tyr Arg
                20   25   30

Ile Phe Thr Thr Ala Thr Val Val Leu Ala Lys Leu Ser Asp Ile Tyr
            35   40   45

<210> 15
<211> 50
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: unavailable

<400> 15
Val Val Lys Phe Ala Ser Leu Asn Lys Leu Val Glu His Leu Thr His
 1   5   10   15

Asp Ser Lys His Asp Leu Gln Phe Leu Lys Thr Phe Leu Met Thr Tyr
                20   25   30

Gln Ser Phe Cys Thr Pro Glu Lys Leu Met Ser Lys Leu Gln Gln Arg
            35   40   45

Tyr Xaa
        50

<210> 16
<211> 77
<212> PRT
<213> Drosophila melanogaster

<400> 16
Leu Thr Arg Ser Ser Arg Asp Glu Pro Leu Asn Phe Arg Ile Val Gly
 1   5   10   15

Gly Tyr Glu Leu Arg Gly Val Ala Ile Ala Thr Gly Asn Ala Ala Val
                20   25   30

Gly Ile Tyr Ile Ser His Val Glu Pro Gly Ser Lys Ala Gln Asp Val
            35   40   45

Gly Leu Lys Arg Gly Asp Gln Ile His Glu Val Asn Gly Gln Ser Leu

Asp His Val Thr Ser Lys Arg Ala Leu Glu Ile Leu Thr
65   70   75

<210> 17
<211> 71
<212> PRT
<213> Homo sapiens

<400> 17
Asn Leu Lys Lys Asp Ala Lys Tyr Gly Leu Gly Phe Gln Ile Ile Gly
 1   5   10   15

Gly Glu Lys Met Gly Arg Leu Asp Leu Gly Ile Phe Ile Ser Ser Val
             20   25   30

Ala Pro Gly Gly Pro Ala Asp Leu Asp Gly Cys Leu Lys Pro Gly Asp
         35   40   45

Arg Leu Ile Ser Val Asn Ser Val Ser Leu Glu Gly Val Ser His His
         50   55   60

Ala Ala Ile Glu Ile Leu Gln
65   70

<210> 18
<211> 67
<212> PRT
<213> Homo sapiens

<400> 18
Ile Val Ile His Arg Gly Ser Thr Gly Leu Gly Phe Asn Ile Val Gly
 1   5   10   15

Gly Glu Asp Gly Glu Gly Ile Phe Ile Ser Phe Ile Leu Ala Gly Gly
             20   25   30

Pro Ala Asp Leu Ser Gly Glu Leu Arg Lys Gly Asp Gln Ile Leu Ser
         35   40   45

Val Asn Gly Val Asp Leu Arg Asn Ala Ser His Glu Gln Ala Ala Ile
         50   55   60

Ala Leu Lys
65

<210> 19
<211> 68
<212> PRT
<213> Rattus rattus

<400> 19
Val Glu Leu Pro Lys Thr Glu Glu Gly Leu Gly Phe Asn Ile Met Gly

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         1                    5                        10                       15
    Gly Lys Glu Gln Asn Ser Pro Ile Tyr Ile Ser Arg Ile Ile Pro Gly
                20                    25                    30

    Gly Ile Ala Asp Arg His Gly Gly Leu Lys Arg Gly Asp Gln Leu Leu
                35                    40                    45

    Ser Val Asn Gly Val Ser Val Glu Gly Glu His His Glu Lys Ala Val
                50                    55                    60

    Glu Leu Leu Lys
    65


    <210> 20
    <211> 65
    <212> PRT
    <213> Homo sapiens

    <400> 20
    Val Lys Val Gln Lys Gly Ser Glu Pro Leu Gly Ile Ser Ile Val Ser
         1                    5                        10                       15

    Gly Glu Lys Gly Gly Ile Tyr Val Ser Lys Val Thr Val Gly Ser Ile
                20                    25                    30

    Ala His Gln Ala Gly Leu Glu Tyr Gly Asp Gln Leu Leu Glu Phe Asn
                35                    40                    45

    Gly Ile Asn Leu Arg Ser Ala Thr Glu Gln Gln Ala Arg Leu Ile Ile
                50                    55                    60

    Gly
    65


    <210> 21
    <211> 98
    <212> PRT
    <213> Drosophila melanogaster

    <400> 21
    Met Val Phe Ala Val Val Asp Lys Ala Gly Thr Val Val Met Ser Asp
         1                    5                        10                       15

    Gly Glu Glu Leu Asp Ser Trp Ser Val Leu Ile Asn Gly Ala Val Glu
                20                    25                    30

    Ile Glu His Ala Asn Gly Ser Arg Glu Glu Leu Gln Met Gly Asp Ser
                35                    40                    45

    Phe Gly Ile Leu Pro Thr Met Asp Lys Leu Tyr His Arg Gly Val Met
                50                    55                    60

    Arg Thr Lys Cys Asp Asp Cys Gln Phe Val Cys Ile Thr Gln Thr Asp
         65                    70                    75                       80
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Tyr Tyr Arg Ile Gln His Gln Gly Glu Glu Asn Thr Arg Arg His Glu
            85   90   95

Asp Glu

<210> 22
<211> 99
<212> PRT
<213> Homo sapiens

<400> 22
Leu Leu Phe Glu Pro His Ser Lys Ala Gly Thr Val Leu Phe Ser Gln
  1   5   10   15

Gly Asp Lys Gly Thr Ser Trp Tyr Ile Ile Trp Lys Gly Ser Val Asn
            20   25   30

Val Val Thr His Gly Lys Gly Leu Val Thr Thr Leu His Glu Gly Asp
            35   40   45

Asp Phe Gly Gln Leu Ala Leu Val Asn Asp Ala Pro Arg Ala Ala Thr
        50   55   60

Ile Ile Leu Arg Glu Asp Asn Cys His Phe Leu Arg Val Asp Lys Gln
  65   70   75   80

Asp Phe Asn Arg Ile Ile Lys Asp Val Glu Ala Lys Thr Met Arg Leu
            85   90   95

Glu Glu His

<210> 23
<211> 97
<212> PRT
<213> Homo sapiens

<400> 23
Ala Met Phe Pro Val Thr His Ile Ala Gly Glu Thr Val Ile Gln Gln
  1   5   10   15

Gly Asn Glu Gly Asp Asn Phe Tyr Val Val Asp Gln Gly Glu Val Asp
            20   25   30

Val Tyr Val Asn Gly Glu Trp Val Thr Asn Ile Ser Glu Gly Gly Ser
            35   40   45

Phe Gly Glu Leu Ala Leu Ile Tyr Gly Thr Pro Arg Ala Ala Thr Val
        50   55   60

Lys Ala Lys Thr Asp Leu Lys Leu Trp Gly Ile Asp Arg Asp Ser Tyr
  65   70   75   80

Arg Arg Ile Leu Met Gly Ser Thr Leu Arg Lys Arg Lys Met Tyr Glu
            85   90   95

Glu

<210> 24
<211> 97
<212> PRT
<213> Homo sapiens

<400> 24
Cys Met Tyr Gly Arg Asn Tyr Gln Gln Gly Ser Tyr Ile Ile Lys Gln
 1   5   10   15

Gly Glu Pro Gly Asn His Ile Phe Val Leu Ala Glu Gly Arg Leu Glu
            20   25   30

Val Phe Gln Gly Glu Lys Leu Leu Ser Ser Ile Pro Met Trp Thr Thr
            35   40   45

Phe Gly Glu Leu Ala Ile Leu Tyr Asn Cys Thr Arg Thr Ala Ser Val
        50   55   60

Lys Ala Ile Thr Asn Val Lys Thr Trp Ala Leu Asp Arg Glu Val Phe
 65   70   75   80

Gln Asn Ile Met Arg Arg Thr Ala Gln Ala Arg Asp Glu Gln Tyr Arg
                85   90   95

Asn

<210> 25
<211> 103
<212> PRT
<213> Mus musculus

<400> 25
Arg Leu Arg Ser Val Val Tyr Leu Pro Asn Asp Tyr Val Cys Lys Lys
 1   5   10   15

Gly Glu Ile Gly Arg Glu Met Tyr Ile Ile Gln Ala Gly Gln Val Gln
            20   25   30

Val Leu Gly Gly Pro Asp Gly Lys Ser Val Leu Val Thr Leu Lys Ala
            35   40   45

Gly Ser Val Phe Gly Glu Ile Ser Leu Leu Ala Val Gly Gly Gly Asn
        50   55   60

Arg Arg Thr Ala Asn Val Val Ala His Gly Phe Thr Asn Leu Phe Ile
 65   70   75   80

Leu Asp Lys Lys Asp Leu Asn Glu Ile Leu Val His Tyr Pro Glu Ser

Gln Lys Leu Leu Arg Lys Lys
                100

<210> 26
<211> 91
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: unavailable

<400> 26
Arg Glu Asp Phe Glu Ile Ile Arg Val Phe Asp Gly Asn Asn Ser Tyr
 1   5   10   15

Arg Ser Gln Ile Ser Arg Asn Ile Val Val Ala Lys His Val Ser Val
             20   25   30

Gln Gln Val Arg Asp Ala Ala Leu Arg Arg Phe His Ile Asn Asp Thr
         35   40   45

Pro Glu Arg Tyr Tyr Ile Thr Gln Val Val Gly Glu Val Glu Glu Glu
     50   55   60

Ile Leu Glu Asp Pro Val Pro Leu Arg Asn Val Lys Arg Pro Glu Gly
 65   70   75   80

Lys Arg Ala Gln Ile Phe Ile Arg Tyr Tyr Asp
             85   90

<210> 27
<211> 129
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: unavailable

<400> 27
Ser Ile Leu Val Thr Ser Gln Asp Lys Ala Pro Ser Val Ile Ser Arg
 1   5   10   15

Val Leu Lys Lys Asn Asn Arg Asp Ser Ala Val Ala Ser Glu Tyr Glu
             20   25   30

Leu Val Gln Leu Leu Pro Gly Glu Arg Glu Leu Thr Ile Pro Ala Ser
         35   40   45

Ala Asn Val Phe Tyr Ala Met Asp Gly Ala Ser His Asp Phe Leu Leu
     50   55   60

Arg His Gly Glu Gly Pro Leu Leu Leu His Leu Ala Ser Pro Val Ala
 65   70   75   80

Arg Leu Pro Gln Glu Leu Leu Arg Val Arg Glu Glu Gly Ala Pro Phe
                85   90   95

Pro Gly Ser Arg Pro Gln Gly Gly Arg Leu His Gly His Cys Ser Glu
               100   105   110

Glu Glu Ala Pro Leu Ala Tyr Arg Ser His Gly Val His Thr Arg Cys
           115   120   125

Gly